

### **Abstract**

Embodiments of the present invention provide for compressing an image matrix by partitioning the image into overlapping sub-blocks, weighting each sub-block, and performing a decomposition of the weighted sub-blocks into a weighted sum of vector outer products, such as a singular value decomposition. Compression is provided by representing the image matrix by a subset of the scalar weights and associated vectors used in the decomposition. Embodiments of the present invention provide for synthesizing an image matrix by performing weighted sums of vector outer products based upon the subsets of scalar weights and associated vectors obtained during compression to provide synthesized sub-blocks, and overlaying and summing the synthesized sub-blocks to provide the synthesized image matrix.

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